Name _____ Class _____ Date _____

Reteaching 3-4

Solving Multi-Step Inequalities

OBJECTIVE: Solving multi-step inequalities and graphing the solutions on a number line

MATERIALS: None

As you solve multi-step inequalities, keep these strategies in mind.

- Circle all the terms with variables. Then decide on which side of the inequality you are going to collect the variable terms. You may want to select the side that has the variable term with the greatest coefficient.
- Rewrite the inequality by using inverse operations in the same way you solve equations. If you multiply or divide both sides by a negative number, reverse the direction of the inequality symbol.
- Check three values on your graph: the number where the arrow starts, a number to the right of the starting value, and another to the left.

Example

Solve $3x + 2 < 5 + 2x$. Graph and check the solution.

$(3x) + 2 < 5 (+ 2x)$ ← **Circle all the terms with variables.**

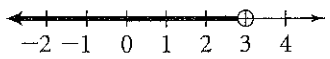
$3x \boxed{+ 2} < \boxed{5} + 2x$ ← **Box all constant terms. Plan your steps to collect variable terms on one side and constant terms on the other.**

$3x + 2 - 2x < 5 + 2x - 2x$ ← **To get variables on the left side, subtract $2x$ from each side.**

$x + 2 < 5$ ← **Simplify.**

$x + 2 - 2 < 5 - 2$ ← **To get constants on the right side, subtract 2 from each side.**

$x < 3$ ← **Simplify.**



← **Graph your solution on a number line. Since 3 is not a solution, use an open circle.**

Check three values for the variable: 0, 3 (where the arrow starts), and 4.

$3(0) + 2 \overset{?}{<} 5 + 2(0)$
$2 < 5$ ✔

$3(3) + 2 \overset{?}{<} 5 + 2(3)$
$11 \not< 11$ ✔

$3(4) + 2 \overset{?}{<} 5 + 2(4)$
$14 \not< 13$ ✔

Exercises

Use circles and boxes to identify the variable and constant terms. Then solve, graph, and check your solution for each inequality.

1. $4x + 3 < 11$

2. $3x + 2 < 2x + 5$

3. $5x + 4 < 14$

4. $4x - 3 < 3x - 1$

5. $3x + 4 > 2x + 3$

6. $2x + 5 > -1$